-REMARKS/ARGUMENTS-

Claims 1 to 19 remain in the application.

Claims1, 2, 6 and 15 have been amended. Support can be found in the description and accompanying drawings. No new matter has been introduced to the claims.

Claims 20 to 33 remain withdrawn from consideration.

Claim rejections – *35 USC § 102*

The Examiner has rejected claims 1-3, 5, 7, 15-19 under *35 USC § 102(b)* as being anticipated by Blakely et al. (3,337,135). Reconsideration is expected on the following grounds.

Blakely discloses an atomizer 10 with fuel injection into the core air passage 14 in a radially inward direction. This is contrary to the present invention. Blakely teaches a nozzle member 12 with an inner sleeve 30 fitted to the outside surface thereof and an outer sleeve 32 fitted onto the exterior surface of the inner sleeve 30. Particularly, Blakely utilizes helical passages 42 and 44 with exit openings 46 and 48 in communication with an annular passageway 36 to deliver flow to radial feed holes 26 and 28. The annular passageway 36 encircles the core air passage 14 and acts as a liquid storage chamber. The radial feed holes 26 and 28 communicate with the annular passageway 36 such that the feed holes 26 and 28 extend radially inward from the annular passageway 36 into the core air passage 14 of the nozzle member 12. Therefore, it can clearly be seen that the fuel is fed radially inward under relatively low feed pressures and without any swirl. Specifically, the fuel from the helical passages 42 and 44 exiting the exit openings 46 and 48 is first received in the annular passageway 36; then, the fuel is injected radially inward to the core air passage 14 where it mixes with the air flow within the nozzle member 12. Thus, the helical channels disclosed by Blakely do not connect directly to the airflow in a highly swirled fashion without any intervening conduits.

Still further, Blakely does not disclose a fuel distributor for providing a fuel film within a combustion chamber of a combustor in a gas turbine engine. The Applicant disagrees with

the Examiner's interpretation of the radial feed holes 26 and 28 as being "fuel filming means". It is unjust to consider the radial feed holes as both the fuel outlet means and the filming means.

Moreover, Blakely does not disclose an outer air passage; hence, the atomizer 10 taught is not a conventional airblast nozzle that could be used in a modern gas turbine engine. Therefore, it can be seen that for at least the reasons set forth above, Blakely does not anticipate nor render obvious the present invention. Reconsideration is solicitated.

The Examiner has rejected claims 1-8, 10-18 under *35 USC § 102(b)* as being anticipated by Farago et al. (5,067,655). Reconsideration is expected on the following grounds.

Farago's whirl channels 42 may have a helical configuration as, for instance, shown in Figures 12 and 13, but the length thereof is less than half a full turn. This does not result in any significant gain in length, as compared to conventional flow metering holes. Farago is attempting to reduce pressure loss in filmer feed in order to increase flow velocity into the filmer. To achieve this goal, Farago must keep the length of the channels 42 to a minimum. That is why Farago's channels 42 in Figures 12 and 13 do not even extend along half a complete turn. Therefore, Farago does not teach introducing excess pressure drop (flow resistance) in the channels by increasing channel length, to balance flows between channels and to improve channel heat transfer.

Furthermore, the whirl channels 42 do not communicate directly with the nozzle outlet orifice 14 but with a whirl chamber 36 defined between the external component 10 and the internal component 22. The whirl channels 42 do not communicate directly with a fuel inlet at an inlet end but rather with a pressure chamber 40. The whirl channels 42 are grooves formed on the lateral areas 30 of a conical frustum leading from the pressure chamber 40 into the whirl chamber 36 radially inward. The fuel and air mix within the nozzle and the mixture is then directed radially inward to the nozzle outlet orifice 14. Farago clearly differs from the present invention.

Moreover, the Farago patent does not deal with air blast or air assist fuel injectors. Farago discloses a simple pressure atomizer utilizing conical bodies such as typically known in the

art. Therefore, the Applicant argues that Farago does not anticipate nor render obvious the present invention. Reconsideration is solicitated.

The Examiner has rejected claims 1-19 under *35 USC § 103(a)* as being unpatentable over Lemon et al (5,423,173) in view of Blakely (3,337,135) and optionally Farago et al. (5,067,655). This rejection is traversed on the following grounds.

Lemon deals with a conventional air blast nozzle construction with a liquid fuel passage 57 and a plurality of axially extending orifices 94 dividing the liquid fuel passage 57. The Applicant points out that the subject matter disclosed by Lemon was presented as prior art in the present application. Furthermore, in view of the arguments presented above with regard to Blakely the Applicant argues that in combination Lemon and Blakely do not teach all the elements of Claims 1 to 9 of the present invention. Similarly, in view of the arguments presented above with regard to Farago the Applicant argues that in combination Lemon and Farago do not teach all the elements of Claims 1 to 19 of the present invention. Therefore, the Applicant asserts that the aforementioned patents do not render obvious the teachings of the present invention.

The Examiner has rejected claims 1-19 under *35 USC § 103(a)* as being unpatentable over Kostka (6,247,317) in view of Blakely (3,337,135) and optionally Farago et al. (5,067,655). This rejection is traversed on the following grounds.

Kostka teaches a single primary fuel chamber 36 that communicates with a nozzle opening 44 for passing the primary fuel used mainly for ignition purposes. Although a secondary fuel passes through spiral passages, the latter direct the fuel radially inward to an annular fuel nozzle 54. Particularly, the spiral passages are defined entirely in an annular insert 51, and it can clearly be seen that the exit ports of the spiral passages are not at the nozzle 54 outlet. The secondary fuel is delivered to the nozzle 54 separate from the annular insert 51 and is directed radially inward to the outlet of the nozzle 54. Moreover, the secondary fuel acts only to sustain the combustion in the combustor after the primary fuel has been ignited (col. 3, lines 34-44). Thus, it can clearly be seen that the fuel distributor taught by Kostka is based on different principles than the fuel distributor of the present invention.

Furthermore, at least in view of the arguments presented above with regard to Blakely and Farago, the Applicant argues that even when combining the teachings of Kostka and Blakely or Farago the elements of Claims 1 to 19 of the present invention are not all taught; and therefore, do not render obvious the present invention.

The Examiner has rejected Claims 1-7 and 10-19 under *35 USC § 103(a)* as being unpatentable over Farago et al. (5,067,655) in view of Blakely (3,337,135). The rejection is traversed at least on the basis of all the reasons presented above. Alone or in combination Farago and Blakely do not teach all the elements of Claims 1-7 and 10-19; and therefore, do not render obvious the present invention.

In view of the foregoing, the application is believed to be in condition for allowance and an early action to this effect would be much appreciated.

Respectfully submitted,

Lew Alexander PROCIW

By: _____

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Date

Sébastien CLARK, Registration No. 56,651
Agent of Record
OGILVY RENAULT LLP
1981 McGill College Avenue, #1600
Montreal, Quebec, Canada H3A 2Y3
Tel.: (514) 847-4259

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